

An Attempt to Interpret the Verse: "Do not the disbelievers see that the heavens and the earth were a joined entity, and We separated them" (Qur'an 21:30)

By Thaer Ahmed Salameh,

When we lift our eyes to the vast sky, we witness an astonishing sight: the expansion of the universe, where galaxies move away from each other in a regular, uniform manner, with speeds proportional to their distance from us. This expansion is not merely random motion; it is an organized pattern that hints at a profound secret. If we were to reverse time, we would find that these galaxies, which appear distant and scattered today, were gradually closer to one another. With each step we take in our time journey towards the past, the distances between them shrink until we reach the zero moment—the moment of beginning—when all matter, energy, time, and space were merged into a single dense entity, a single point, before the universe "exploded" and expanded to take its current shape.

But the more critical question is: Was it truly an explosion? Is the term "Big Bang" accurate?

When we reverse time to study the moment the universe emerged after its creation, we find ourselves at the edge of the first second following the "Big Bang," approaching Planck time, which represents  $10^{-43}$  of the first second. At that moment, the matter of the universe was solidified in an unimaginable way—extremely dense, hot, and pressurized. However, despite this enormous solidity, matter cannot reach infinite levels of rigidity because increasing rigidity would increase the speed of sound, which, if it exceeded the speed of light, would be physically impossible. This means there is a certain limit to the rigidity of matter, and when that limit is reached, gravity overcomes the rigidity and compresses the matter into an incredibly small point. But what is the counteracting force that will separate this gravitational pull and push the matter into expansion? This force, which will separate the matter in a harmonious manner, must be greater than gravity. There must be a precise calculation of that force's magnitude and direction because the "Big Bang" was not chaotic; rather, it was the result of a meticulous balance.

The concept of fine-tuning here refers to the precise value of dark energy or the cosmological constant itself, not necessarily the difference between gravitational and anti-gravitational forces. The fine-tuning relates to the specific value of dark energy, where this value must be within a very narrow range. If this value were slightly higher, the universe would have expanded too quickly, preventing the formation of cosmic structures such as galaxies. If it were slightly lower, gravity would have caused the universe to collapse on itself.

The universe's movement is driven by two forces: gravity, which pulls it towards contraction, and dark energy, which pushes it towards expansion. Dark energy has taken on a specific and extremely precise value, such that if this value were higher or lower by even a minuscule amount, the universe could not have continued its current expansion. If the value of dark energy were slightly lower, gravity would have overcome the expansion, and the universe would have collapsed on itself. If it were slightly higher, matter would have scattered too quickly, preventing the formation of galaxies and stars. This precise balance indicates that the density of the universe at the moment of the Big Bang was very close to the critical density, explaining why the universe is perfectly flat, confirming that it had to be this way.

Stephen Hawking estimated that "even a decrease by one part in a million million when the temperature was  $10^{+10}$  degrees would have caused the universe to start contracting when the temperature reached 10,000 degrees."

Stephen Hawking: "A Brief History of Time" - His lectures and research on the origin of the universe and the Big Bang.

Professor Paul Davies, a professor of mathematical physics at the University of Adelaide in Australia, conducted extensive research and concluded with a stunning result: any change in the speed of the universe's expansion, no matter how slight—even by  $1/10^{18}$  or 1 in a billion billion at the moment of the cosmic explosion—would have prevented the universe from coming into existence. We can write this previous percentage as 0.000000000000000001, meaning that even a change of such a minuscule amount would have made the universe impossible! Professor Davies comments on this result, saying: "The calculations indicate that the universe is expanding at an extremely precise speed. If the universe had slowed down slightly, contraction due to gravity would have occurred; if it had sped up slightly, the matter would have scattered and vanished into cosmic space. The balance between these two dangerous possibilities reflects the precision and sensitivity of this speed. A change in the expansion speed after the explosion by just  $1/10^{18}$  would have been enough to disrupt the balance. Therefore, the speed of the universe's expansion is finely tuned to a remarkable degree. As a result of this fact, the Big Bang cannot be considered an ordinary explosion but rather an explosion that is organized and meticulously calculated from every aspect." Paul Davies: "The Goldilocks Enigma: Why Is the Universe Just Right for Life?" and "The Mind of God: Science and the Search for Ultimate Meaning" - His works discussing the precision of cosmic balance.

However, more recent studies have reached even more precise figures in the meticulous calibration of dark energy that drives the universe's expansion:

**Research on "Dark Energy":** • Recent research on "dark energy," which constitutes about 68% of the universe's components and drives the universe's expansion, suggests that this energy plays a crucial role in the expansion of the universe. A study published in *Physical Review Letters* in 2018 discussed the possibility that a slight change in dark energy could significantly alter the universe's fate. The results indicate that any change by  $1/10^{60}$  in the density of dark energy could have either caused the universe to collapse or expanded it excessively to the point of disintegration. This means that the calibration of the dark energy force, which opposes gravity, had to be tuned to an unimaginable degree. If this calibration differed from its current value by one part in 10 followed by sixty zeros, the Big Bang would not have resulted in the universe we know today! What a magnificent design this precise calibration of the universe represents!

Paul Davies says: "If one could reverse the universe back, the galaxies would draw closer and closer until they merged and compressed into an extremely dense state. One might wonder during this backward journey whether there is a limit or a certain degree to this compression. It is easy to observe that there is no easy limit to it. Suppose there is a maximum limit to compression; then there must be a kind of force pushing outward and capable of 'overcoming' this immense gravity; otherwise, gravity would prevail, and the matter would continue to compress further. Moreover, this outward-pushing force must be enormous because the internal gravity grows infinitely with increasing compression! So what could this force needed to achieve stability be? However, even though we do not know the details of these forces, some general considerations still need to be applied."

Pause for a moment and pay attention to the following important point to prove that the universe is created! Looking back, we find that the universe began with extreme values of heat, pressure, and density, and then these values began to decrease over time. But what is astonishing is that these values were not

acquired as a result of the self-compression of matter but were present from the moment of creation. This indicates that the matter was created with extreme values from the beginning, and these values were given to it externally, by the Creator. This, in turn, points to the existence of a Creator capable of giving matter these extreme values and defining them with precision. Then, these values began to decrease over time. The temperature of the universe at the moment of the Big Bang was approximately  $10^{32}$  Kelvin. This number can be described as one hundred million trillion trillion Kelvin, a temperature so immense that it cannot be compared to anything we know today. This temperature was given to the universe at the moment of creation, not acquired by the universe as a result of its compression. As for the pressure estimates at that moment, they far exceed anything imaginable, estimated at around 10 raised to the power of 94 Pascals. Also, the degree of compression was not formed as a result of our reversing the arrow of time (and the arrow of time does not move from the future to the past), but it is an initial value given to matter as a result of creation, because matter, energy, time, and space all began at the moment of creation with those extreme initial values resulting from creation!

However, the universe did not explode due to the high pressure but due to a very precise calibration of many variables, ensuring that the explosion was organized, not chaotic. As Dr. Martin Rees said, "The pressure in the early universe was uniform in all respects; there were no edges or empty regions." This means that if we imagine all the matter in the universe that has formed this vast space of heavens, which today extend for more than 92 billion light-years filled with galaxies exceeding two hundred billion galaxies, all compressed into an extremely small, highly dense space, we would find that describing the Big Bang as an explosion is far from accurate in describing the splitting apart of this tightly bound entity that contained all this matter and energy because this splitting apart had to be extremely orderly.

This suggests that the Big Bang was more akin to an organized splitting than a chaotic explosion. This organized explosion is evidence of the Creator who ordered the universe from the very first moment of creation.

Before we delve into the crucial difference, we want to clarify that Dr. Martin Rees says: "The primordial gases cooled and dissolved; just as the contents of a box do when it is opened, the extreme gravity resulting from pressure and thermal energy actually slowed down the expansion. This harmonious picture, however, leaves a mystery behind; despite everything—and since the analogy with an explosion is flawed—it does not explain why the expansion occurred at all. The Big Bang theory assumes that everything was prepared with sufficient energy for the expansion to occur. We must consider the early stable stages to answer why the expansion happened in the first place, while we lack direct evidence for that physics and a full understanding of it."

And this is the crux of the matter when we ask about the arrow of time and its exact direction, from past to future, not the other way around. So everything, therefore, was prepared and pre-set with sufficient energy, necessary heat, pressure, and gravity. These values were not prepared or set by internal factors within the matter that caused more attraction or compression, etc.!

If the issue was that the universe was shrinking and compressing as we go back in time, we would say that the values it reached were the result of that compression or contraction, meaning we would say those were self-generated factors, values the matter acquired due to its self-compression. But the universe began with these values, and then these values began to decrease as the arrow of time moved from the zero moment to the present. Therefore, these values were given to matter from outside, from the Creator, and matter did not acquire them as a result of its self-compression or the "effect of its own gravity." Gravity

did not elevate these values from smaller to maximum values; instead, they existed at those maximum values directly, in one go, without precedence, at the moment of the beginning. It started with them, which indicates its need for someone to bestow those values upon it, and that they were not self-generated by the matter!

If gravity and the outward-pushing force are limited by an initial value, there is no doubt that the initial temperature, pressure, density, and other variables also had initial values! And the fact that they had initial values means that they transitioned from non-existence to existence possessing those initial values, not that they acquired those initial values as a result of further compression of matter, or more attraction, or higher heat. The maximum values were there at the beginning, then started to decrease; those values were given to matter from outside! Matter was created with those values! This is proof of the Creator!

Proof of the Creator from two aspects: First, the matter and energy's acquisition of certain extreme initial values that started decreasing afterward, which is an acquisition not generated by the matter itself, as the matter was created possessing high values of those parameters. And second, because those values were given with "precise, meticulous calibration" that determined the difference between the expansion force (dark energy) and the gravitational force (enormous gravity) and were tuned with incredible precision, establishing the gentle expansion that continues to this day in the universe's harmony and precision. Thus, the fine-tuning began at the moment of creation and was a prerequisite for the productive formation of an orderly universe, not chaos!

### **An Organized or Chaotic Explosion? Was the explosion due to high compression or infinite high attraction at the beginning?**

Martin Rees says: "It is wrong to think that the high pressure in the early universe was the 'leader' of the explosion; explosions result from pressure disturbance, where the explosion of bombs on Earth or supernovae in the universe causes a sudden burst of internal pressure that ejects debris into the lower-pressure environment, but in the early universe, the internal pressure was the same in all respects; there were no edges, and there was no 'empty' region outside!"

Moreover, we always describe the system from which the universe began as having low entropy, meaning without randomness. So how did the universe arise initially with very low entropy, starting from extreme order, where if the bound matter that contained the initial matter of the universe had any irregular matter under immense pressure and gravity, it would have turned into a black hole!

Paul Davies said: "The first and most obvious question was: What really caused the Big Bang? The related question was: Why was the Big Bang of this size instead of being larger or smaller? What exactly determined its momentum? There was the puzzle of the universe's massive flat geometry, and the secret related to it—why was the universe's 'mass-energy' not different from zero? [i.e., its total sum] But the bigger dilemma was the extraordinary uniformity of the universe on a large scale, as reflected in the smoothness of the cosmic microwave background radiation, [or the afterglow of the Big Bang that has been captured and studied since 1965, filling the entire universe] As I mentioned earlier, on scales of billions of light-years, the universe appears almost the same everywhere, and similar observations apply to expansion, as the expansion rate is the same in all directions, and as far as we know: in all cosmic regions... For example, a larger explosion would have scattered cosmic gases too quickly to gather into galaxies, and conversely, if the Big Bang had been smaller, the universe would have collapsed on itself before life began... The universe expands slowly enough to allow galaxies, stars, and planets to form, but

not so slowly as to risk a rapid collapse." Therefore, it was an extremely organized splitting, precisely calculated, meticulously calibrated, with an orderly geometry achieved only by precise, meticulous calibration of many variables. Could the inert matter have done all this, when if left to its own devices, it would have produced limitless chaos? Or was it the Great Creator? Without a doubt, it was the Great Creator!

**"Do not the disbelievers see that the heavens and the earth were a joined entity, and We separated them" (Qur'an 21:30):**

We have proven, therefore, that the expanding universe began at a certain moment in time from a "joined entity" sometimes called the "cosmic egg" through what is termed the "Big Bang" or "the Great Splitting," and the term "splitting" is more accurate than "explosion." As Dr. Martin Rees states, "Comparing the Big Bang to an explosion caused by high disturbed pressure in the early universe is misleading because the pressure in the early universe was uniform in all respects, as there were no edges, and there was no 'empty' region outside! Therefore, it does not completely fit the typical 'explosion' imagery."

Professor Paul Davies believes that "it is unlikely that an explosion could cause a smooth, consistent, and 'isotropic' expansion because explosions are usually random, and if the Big Bang had been even slightly uneven, with the expansion rate in one direction exceeding the rate in another direction, the universe would have become more and more disorderly as the faster galaxies moved apart. However, we do not observe this, so it is clear that the Big Bang had the same momentum in all directions and in all regions of the universe, and it was 'tuned (precisely calibrated) to a high degree of accuracy, which seems puzzling enough.'"

Of course, this does not puzzle us because we see in it a causality that the mind cannot overlook and must attribute to the Great Creator!

Given that the matter was extremely solid and dense, separating it from each other is closer to the description: splitting, and gathering it together as matter and radiation (energy) applies to the description of joining, as joining is the opposite of splitting. It is a state of cohesion, adherence, and connection without cracks. Therefore, it is more accurate to call it the Great Splitting!

This is how Allah described it in the Qur'an when He said: "Do not the disbelievers see that the heavens and the earth were a joined entity, and We separated them, and made from water every living thing? Then will they not believe?" (21:30). By examining the meanings of the word "joining" in Arabic language dictionaries, we conclude that joining is the opposite of splitting, and it is the welding of the split and its repair to rejoin, indicating a state of adhesion, cohesion, and complete closure, with no cracks. Splitting, on the other hand, is the process of cutting and separating a well-connected, cohesive entity, and at the same time, it causes the splitting elements to emerge and separate, revealing characteristics that were hidden in the state of joining and gathering. Splitting is opening and cutting a cohesive entity, exposing what is inside by applying a force that tears or splits it, causing it to diffuse like musk when something is added to it to extract its scent, or appearing like the sun after clouds split apart. Similarly, it can also mean the emergence of differences after cohesion, where things gather and mix until their types are indistinguishable, and then, when split and separated, they differentiate and become apparent. The Qur'an chose the word "splitting" instead of "cracking," "rupturing," or "breaking," despite their similar meanings. Cracking subtly implies hardship, and Allah clarifies that creating the heavens and the earth did

not tire Him: "And We did certainly create the heavens and earth and what is between them in six days, and there touched Us no weariness." (Qur'an 50:38). The word "rupturing" is closer to creation and formation, and the context of verse 30 from Surah Al-Anbiya is about the splitting of the joined entity that contained all the matter that would later form the heavens and the earth from each other, so the most accurate term is splitting.

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